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ABSTRACT

Prepared by an instructor and curriculum specialists, this course of study was designed to meet individual needs of the dropout and/or hard-core unemployed youth by providing skill training, related information, and supportive services knowledge in small engine maintenance and repair. Students enrolled in this course work independently on a variety of two and four cycle gasoline engines, with instructional units in servicing, adjustment, repair, and overhaul. The achievement level of each student is determined at entry and small instructional units provide continuing positive reinforcement and minimize frustration. Brief descriptions of other instructional areas, teaching techniques, materials utilization, motivational devices, and case studies are appended. Related materials are available as VT 011 518-VT 011 533 in this issue. (GR)

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SMALL ENGINE
MAINTENANCE and REPAIR

COURSE DESCRIPTION

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THE MINNEAPOLIS
PUBLIC SCHOOLS

WORK OPPORTUNITY CENTER
107 Fourth Street Southeast
Minneapolis, Minnesota 55414

1969

SMALL ENGINE MAINTENANCE and REPAIR

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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INTRODUCTION

In May 1966 the Minneapolis Public Schools received a Federal Grant under section 4C (Research) of the Vocational Education Act of 1963. This grant was provided to finance an educational endeavor designed to meet the individual needs of the dropout and/or hard-core unemployed youth in the 16 through 21 year age group in terms of skill training, related information and supportive services.

Funds are also received from the Minnesota Department of Vocational Education, Title III of the National Elementary and Secondary Education Act, and the Minneapolis Public Schools. All certificated personnel at the Work Opportunity Center must be vocationally certified under the Minnesota State Plan for Vocational Education.

It was felt at the outset that if we were to deal effectively with students in school, it would be necessary to help them deal with their problems out of school. At the present time the WOC staff numbers fifty. Included are personnel in guidance, work coordination, social work, research, health, clerical, building maintenance, and administration.

Facilities are provided in the following areas: Business Education, Communications (related), Creative Art, Drafting (related), Dry Cleaning, Electricity and Electronics, Food Preparation and Service, Homemaking (clothing and interior decorating), Homemaking (personal improvement and focds), Machine Tool Operation, Marketing and Merchandising (retail sales), Mathematics (related), Nurses Aide and Hospital Orderly, Offset Printing, Reading (remedial and developmental), Service Station Attendant and Light Automotive Maintenance, Small Engine Maintenance and Repair, and Social Communications (related). Brief descriptions of these instructional areas appear in Appendix A of this report.

Because of a general and local need for workers in nearly all occupations, the selection of technical course offerings was based largely on kinds of occupations, i.e., those in which a worker has good opportunities for advancement if he has the ability and desire to do so.

Because this report is concerned with the curriculum of a particular instructional area, program descriptions of supportive services are not included. This information is available in the WOC Summary Report of Activity and Research for the period May, 1966 to June, 1968.

The basic differences between instruction at the WOC and in conventional schools are in the setting and the approach.

The setting is a non-school type building with an informal, relaxed atmosphere. Class size is small. No one is ever too busy to give a student some of his time when the student needs it. The unique feature of our "rules and regulations" is that they are either functional or non-existant. The Student Advisory Committee has a strong voice in determining the rule structure at WOC and its implementation. A basic requirement is that a student be enrolled in a technical area. Other than that, decisions are made by students, with all the help they need or will accept from teachers, counselors, social workers, work coordinators, clerical staff, and administration.

The approach focuses on the individual. His needs are paramount. Each student is accepted as he is. His level of achievement or performance is determined, not assumed. He is taken from where he is and is assisted as far as he will go in the shortest possible time. No instructor or student is burdened with a standardized curriculum or a fixed set of materials. Grades are not used. Content is broken down into small instructional units in order to provide continuing positive reinforcement

and to minimize frustration. Successes, however insignificant, are emphasized. Instructors are sincere in their efforts with students for two reasons: 1. Teacher selection was based largely upon the possession of this characteristic of sincereity and, 2. An instructor without a sincere approach would soon have an empty classroom, for the only "hold" he has on his students are the relationships he can establish with them. These positive relationships are not always easy to establish, in fact, are not established at all in some cases (we also have our dropouts).

A listing of techniques, materials, and motivational devices that have been selectively utilized by WOC staff appear in Appendix B of this report.

The results of this kind of an approach are satisfying when evaluated in terms of positive attitudinal changes over a period of time. An outstanding example is the fact that in a school population where approximately one-fourth of the students are on probation or parole, and nearly all have dropped out of the conventional school, there has not been one discipline problem in a classroom or training area.

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STATEMENT OF OBJECTIVES

To develop in each student:

1. An understanding of the principles of operation of small gasoline engines and the knowledge and skills necessary for their adjustment, maintenance, and repair.

2. Good work habits and a positive attitude toward work.

3. An awareness of job opportunities related to this field.

OBJECTIVE 1

To develop in each student an understanding of the principles of operation of small gasoline engines and the knowledge and skills necessary for their adjustment, maintenance and repair.

A student achieving this objective will:

1. Understand the differences between two and four cycle gasoline engines.
2. Have a knowledge of fuel and lubrication requirements for gasoline engines.
3. Understand carburetion and the venturi principle.
4. Possess a knowledge of electricity as utilized by battery and magneto ignition systems.
5. Understand combustion heat problems and engine cooling requirements.
6. Be familiar with a variety of drive mechanisms that are commonly used in conjunction with small engines.
7. Correctly diagnose causes of small engine malfunctions.
8. Be able to maintain, adjust, and/or repair a variety of small gasoline engines.

OBJECTIVE 2

To develop in each student good work habits and a positive attitude toward work.

A student achieving this objective will:

1. Develop confidence and a feeling of self-worth.
2. Be aware of employer expectations.
3. Acquire a cooperative attitude about working with others.

4. Know and apply the principles of shop safety.

5. Develop a respect for tools and the property and rights of others.

OBJECTIVE 3

To develop in each student an awareness of job opportunities related to this field.

A student achieving this objective will:

1. Be aware of the wide variety of equipment that employs small gasoline engines for power.

2. Know what kinds of businesses employ small engine mechanics.

3. Know what wages, fringe benefits, and working conditions are common to this field.

4. Be familiar with job opportunities and the possibilities for self-employment in this field.

ATTAINMENT OF OBJECTIVES

New students assigned to the area are asked to fill out a personal history card. The information asked for includes work history and hobbies. The responses provide a basis for discussions between the student and instructor. These discussions help establish a good relationship. The new student is oriented to shop (classroom) requirements and procedure. He is shown how to use the time clock and the reasons for using it are explained. He is assigned a storage locker for small parts. The procedure for taking rest breaks is discussed and the students learn what written material is utilized. The use of tool panels and location of various pieces of equipment is also covered.

For the first few class periods a student is assigned to observe and work with the more advanced students on a rotational basis. In addition to the instructional benefits, this technique enables the student to become acquainted with others in the shop. Usually the advanced student has an engine about ready to start and run. It has been found that attendance is related directly with frequency of engine run up. Who the engine belongs to is also a motivational factor. Students work best on their own personal engines. They are less interested in customer or faculty owned engines and least interested in working on school owned training engines.

As soon as a new student has learned where things are in the shop he proceeds through a series of short training units on ignition and carburetion with related discussions using slides, overhead projector, wall charts, and cutaway models. After each exercise the engine is started and run. The student progresses then to witness marks and engine

disassembly and reassembly working alone or with another student. The use of the compression gauge, valve refacing, regrinding, and ring replacement is covered. Students who have prior knowledge move through familiar areas rapidly. Bearing fit and timing marks are emphasized. Oil classifications and engine coding are then covered. Individual, over-the-shoulder instruction and small group (four to eight students) demonstrations on actual engines is most effective. Students work on three or four of the most popular makes in both vertical and horizontal shaft models.

Outboard engines are usually avoided until the student has a good understanding of smaller air cooled engines.

Students are encouraged to seek help from each other and to reason why an engine might have a particular set of symptoms. They then check with the instructor before attempting to correct a malfunction.

All work is recorded on the student's time card and is regularly checked by the instructor. Students are constantly praised and encouraged. At least once each week the instructor talks with each student to see if he feels he is doing anything new, different and interesting for him. The work progress on the time card is discussed and if there is evidence of too many repetitions of particular operations, future assignments are made with this in mind. A student is given a choice of any one of three tasks on each assignment. He has an opportunity to let his "mood for the day" work for rather than against his growth.

When student or instructor feel the student is ready for job placement or recommendation for credit an individual conference is held and it is decided if the test should be oral or written. The test used is instructor made. It is comprehensive, covering basic fundamentals and

concepts. It does not require the memorization of technical data.

When approximately 80 clock hours of work have been accomplished the instructor and student's counselor discuss recommendation of credit. If employment seems advisable, the work coordinator is made aware of the student's particular attributes and set of circumstances.

Many students participate in the Neighborhood Youth Corps and Work Study programs while attending the Work Opportunity Center.

INSTRUCTIONAL TOPICS

1. Orientation

   shop procedures
   student goals
   instructor expectations
   work habits and shop safety
   present and future job opportunities

2. Basic Principles

   internal-external combustion engines
   compression
   fuel-air-ignition

3. Ignition

   service spark plugs
   remove shrouds and flywheel
   clean all parts
   discuss magneto operation and theory
   identify parts and their function
   test coil-capacitor-wires-contact points
   repair or replace necessary parts
   reassemble unit
   clean and return all tools and equipment
   start and run engine

4. Fuel System

   discuss carburetion
   dismount and disassemble carburetor
   clean all parts of the fuel system
   identify parts and their function
   reassemble carburetor and fuel system
   start engine
   adjust jets and linkage
   clean and return all tools and equipment

5. Auxiliary Components

   discuss lubrication, cooling, flywheel functions
   starter mechanisms
   governors and their purpose
   study air and oil flow

6. Two Cycle Engine

clean
completely disassemble
identify all parts
perform any needed repairs
reassemble in running condition
clean and return all tools and equipment
fill with oil - start and run engine

7. Four Cycle Engine

clean
completely disassemble
identify all parts
perform any needed repairs
reassemble in running condition
clean and return all tools and equipment
fill with oil - start and run engine

8. Rotary Lawn Mower Blade

remove
clean
sharpen
balance
have checked
reinstall
clean and return all tools

9. Outboard Lower Unit

disassemble
clean all parts
identify all parts, explain their functions
trace the water flow
reassemble and test
clean and return all tools and equipment

10. Miscellaneous Topics

regularity of attendance
shop clean-up
tool organization
painting of projects
working on drive mechanisms
assisting other students
helping with training aids
cutting gaskets (other parts)
extra reading and effort
other helps to the Small Engines program

SELECTED ANNOTATED BIBLIOGRAPHY

BOOKS

Atteberry, Pat H., Power Mechanics. Homewood: Goodheart-Wilcox Company.

Basic theory of internal combustion engines is presented in a clear, easy to understand style.

Glenn, Harold T., Exploring Power Mechanics, 2nd edition. Peoria: Charles A. Bennett Company, Inc. 1967.

A profusely illustrated text covering Briggs & Stratton, Honda, O.M.C., and Wisconsin engines.

PUBLICATIONS OF GOVERNMENT OR OTHER ORGANIZATIONS

A Power Primer. General Motors, Detroit, Michigan.

A well illustrated booklet providing a comprehensive introduction to internal combustion engines.

The several following entries are service manuals that, in general, contain repair instructions as well as technical and parts data for specific engines.

Briggs & Stratton Parts and Service Manual. Briggs & Stratton Corporation, Milwaukee, Wisconsin.

Mechanics Handbook. Lauson-Power Products Parts Depot Division, Tecumseh Products Company, Grafton, Wisconsin.

Outboard Service Manual. Kiekhaefer Corporation, Fond du Lac, Wisconsin.

AUDIO-VISUAL MATERIALS

Slides:

Aluminum Engine Overhaul. Briggs & Stratton Corporation, Milwaukee, Wisconsin.

A series of sixty-eight 2" x 2" slides showing the steps in the overhaul of an aluminum, one cylinder, Briggs & Stratton engine.

Printed Materials:

Combustion Engines. Minnesota Mining and Manufacturing Co., St. Paul, Minnesota.

A series of printed originals depicting exhaust and compression strokes for two and four cycle engines, valve operation, carburetion, etc. Selected ones are duplicated and handed out and/or duplicated as transparencies for use with the overhead projector.

Internal Combustion Engines. Ford Motor Company, Dearborn, Michigan.

A set of large wall charts covering internal combustion engines.

Outboard Motors. Mercury - Kiekhafer Corporation, Fond du Lac, Wisconsin.

A set of wall charts containing information about outboard motors.

APPENDIX A

BRIEF DESCRIPTIONS OF WORK OPPORTUNITY CENTER INSTRUCTIONAL AREAS

BUSINESS EDUCATION

Instruction is offered in typing, filing, bookkeeping, record keeping, and in the use of small calculators, key punch machines, and office duplicating equipment. All instruction is based on current business practice. There are many positions open to students who complete this training. Included are jobs as typists, file clerks, receptionists, and key punch operators.

COMMUNICATIONS (related)

Students work individually at improving their oral language usage, writing skills and study habits. A wide variety of printed materials, audio-visual equipment and materials, and the use of individual study carrels facilitate student progress. Work may be directed toward transfer credit, GED test preparation, or job related skills.

CREATIVE ART

Students work independently. Individual instruction is provided with a wide variety of materials and equipment. The goal is the development of confidence in the areas of decision making, self-expression, and evaluation in art and everyday life. Within this framework, a student may study in depth or he may explore several areas.

DRAFTING (related)

Students taking this course learn the basic elements of drafting. The instructor cooperates closely with the teachers and students in the machine tool operation and electricity and electronics areas in order to teach the drafting and blueprint reading related to these specialized occupations. There are many positions open to machine draftsmen. The skills involved are also basic to a variety of related jobs. Qualified students are referred to area vocational schools, technical schools, or apprenticeship programs for further training.

DRY CLEANING

Students in this area are instructed in all phases of operation of a modern dry cleaning plant. They are encouraged to specialize if they express a desire to do so. Instruction in marking, invoicing, and customer service is handled by the marketing and merchandising teacher. Students can learn basic tailoring and garment repair in the sewing section of the homemaking area. Persons possessing these skills are in great demand in the Minneapolis, St. Paul area.

ELECTRICITY AND ELECTRONICS

This course provides instruction in the fundamental principles of electricity and electronics. Topics include codes, laws, terms, and techniques common to this field. Modern testing equipment is used to diagnose and locate problems in radio and television receivers in order to complete necessary adjustments or repairs. With the present rapid expansion of this field, persons with basic knowledge and skills have little difficulty finding positions in production, service and repair or in advanced training programs.

FOOD PREPARATION AND SERVICE

Students in this area are instructed in the preparation and serving of soups and sauces, vegetables, meats, desserts, and breads. They also gain experience in selecting, ordering, receiving, and storing foods. Instruction is given in proper methods of setting tables and serving customers for those interested in this phase of the industry. Students completing this course are qualified to work in one or more of the following positions: salad worker, short order cook, cooks helper, kitchen worker, bakers helper, and waitress or waiter.

HOMEMAKING (clothing and interior decorating)

Students in this course receive instruction and practical experience in the areas of sewing, garment selection, and home and money management. Other units include interior decorating and related crafts. A special unit in basic tailoring is available for men that are learning dry cleaning. Students may use these skills in their own homes or as a basis for a variety of related occupations.

HOMEMAKING (personal improvement and foods)

Students taking this course work independently in the following areas: personality development, health improvement, foods, and marriage and family living. Topics covered within these areas include proper diet, exercise, grooming, wardrobe care and planning, visual poise, home food preparation, infant care, etc. Young men or women may select one or more parts of this program according to their interests or needs.

MACHINE TOOL OPERATION

Training in machine tool operation stresses the development of skills through practical experiences. Instruction is also provided in related topics. Machines used include the drill press, engine lathe, bench grinder, surface grinder, cutoff saw, and vertical and horizontal milling machines. Students completing this training are qualified for a variety of entry level positions in machine shops.

MARKETING AND MERCHANDISING (retail sales)

Emphasis in this course is placed on retail sales. Theoretical and practical instruction is provided in clerical skills, duties of salespersons, the selling process, and human relations. Review and practice in mathematics and communications is arranged when necessary. Two specialized areas included are cashier-checker and dry cleaning counter girl training. Many full and part-time positions are available to students possessing skills in the field of retail sales.

MATHEMATICS (related)

Instruction is provided on an individual basis for students who desire mathematics related to their technical interests. Work in this area may also be directed toward a high school diploma or the GED certificate. A stimulating variety of materials and methods are used to present theory and practical application.

NURSES AIDE AND HOSPITAL ORDERLY

Students taking this course are instructed in the knowledge and skills necessary for working as aides or orderlies in hospitals and nursing homes. Six to twelve hours a week are spent caring for patients in hospitals or residents in nursing homes. This experience is also valuable to students in home situations.

OFFSET PRINTING

This course provides training in offset printing and related darkroom procedures. Instructional units include composition and layout, process camera operation, stripping, plate making, small press, and finishing operations. Minnesota ranks very high nationally in the number of workers employed in the graphic arts industry. Students completing this course find many entry level positions open to them.

READING (remedial and developmental)

The specific nature of each student's reading problem is diagnosed. A program for remediation or improvement is designed by the instructor and student. A variety of equipment and material is used, ranging from that suitable for very disabled readers to that useful with students reading at the college level. An effort is made to relate classroom experiences to the technical area in which the student is enrolled. Emphasis is placed upon individual contact, with each student given continuing encouragement in his efforts to improve.

SERVICE STATION ATTENDANT and LIGHT AUTOMOTIVE MAINTENANCE

Training in this area is carried on in a WOC operated service station that is open to the public. Instruction is provided in driveway sales, lubrication, engine tune-up, brake work, and other repair and maintenance tasks short of major overhaul or body work. Students may receive related instruction in mathematics, sales, accounting, communications, etc. at the Center in addition to the related units taught at the station.

SMALL ENGINE MAINTENANCE and REPAIR

Persons enrolled in this course work independently on a variety of WOC, student, and customer owned two and four cycle gasoline engines. Instructional units in servicing, adjustment, repair, and overhaul are included. Students seeking employment in this field or those having to operate small gasoline engine powered equipment benefit greatly from this instruction.

SOCIAL COMMUNICATIONS (related)

Student interests and needs are given primary attention. The course offerings include independent study in psychology, government, labor unions, human relations, etc. A large number of references and audio-visual aids are available for student use. Instruction is presented on an individual basis as well as in small discussion groups.

APPENDIX B

TECHNIQUES, MATERIALS, AND MOTIVATIONAL DEVICES

Techniques, materials, and motivational devices that have been selectively utilized by Work Opportunity Center staff are listed below.

TECHNIQUES

1. Teacher-student talks. Teachers endeavor to determine where a student is, achievement-wise, and work with him from that point.

2. Subject matter content is divided into short instructional units, one-half to two or three hours in length.

3. Students are praised for completing a task or short unit. They may receive awards of merit for completing groups of units three or four weeks in length.

4. Students are often allowed to make their own choice as to what materials they will read or study.

5. Work and a record of progress is frequently kept up to date by the student. Self-evaluation - kept in individual student folders.

6. Teachers encourage students to move on to successively difficult tasks when success has been achieved on easier ones.

7. Open door policy - a student may come in anytime either to work or ask a question. Students are, however, encouraged to attend classes as they are scheduled.

8. Frequent, well organized field trips. Students decide where to go and what to look for.

9. Students are asked to make written comment on what they read - little correction - emphasis is placed on ideas and expression, not on grammar, spelling, etc. - teacher learns from and about student.

10. Compliments received concerning performance, attitude, etc. are shared with the student or students involved.

11. Good attendance is encouraged - emphasis is placed on days attended, not days missed.

12. Students keep own attendance by signing in and out of class.

13. Students are occasionally given blocks of work and allowed to progress as fast as possible.

14. Students are urged to call in when they are going to be absent. If a student doesn't call, the instructor or outreach worker calls the student. The emphasis is on better attendance, not excuses.

15. Classroom atmosphere is informal, relaxed, conducive to self-expression. Adverse competition is all but eliminated.

16. Student participation in planning the next day's work increases attendance.

17. Success is increased greatly when class size is kept small. This permits more individual attention, closer supervision, and programs of instruction tailored to individual needs and rates of learning.

18. Teachers notify intake personnel when they feel their class is full. The class size varies with the amount of individual attention each student needs. When the teacher can work with more students they are assigned.

19. Incoming students are given a brief test to determine reading level. Instructors are made aware of each student's reading ability. Students may also be programmed into a remedial or developmental reading situation.

20. Student and teacher work out the fine points of scheduling - agree on short and long-term goals.

21. The programming of students and jobs through the shop is done in the manner followed in industry.

22. Length of class periods and courses are flexible - depends on student proficiency and attitude.

23. Each individual is accepted as worthy regardless of personal appearance, manner of dress, or personality characteristics that may seem negative.

24. The use of advanced students to assist in the instruction of newer students has positive effects on both.

25. Instructors endeavor to establish a "helping" relationship..."I am going to help you get ready for this job." This approach emphasizes "partnership" in learning.

26. Every effort is made to get the students "doing" as soon as possible.

27. Two or more training areas may cooperate in teaching several phases of a course, e.g. Dry Cleaning - Marketing and Merchandising - Homemaking (sewing).

28. Lecturing, preaching, bossing, or threatening by the instructor is avoided.

29. Students are allowed to clean and press their own clothes or those of their family. They become much more critical of their work in these cases.

30. Homework is not assigned unless a student expresses a desire for it.

31. Most technical areas require very little reading or written work. Emphasis is placed on performance.

32. New students enter the program every week.

33. An intensive two-day orientation program is designed to made students feel comfortable in a new setting.

34. Students in the food preparation area plan a menu for the week and then prepare all of the food. Cafeteria-classroom is open to the public.

35. When a student exhibits greater than average interest in an area or department he is encouraged to specialize.

36. Regular office desks and equipment are used in Business Education. Room is arranged like an office.

37. Students are encouraged to accept their peers.

38. Students are asked to underline words or phrases in paperbacks or magazines. The instructor and student then go over these together.

39. The Marketing and Merchandising area is organized like a retail store using regular store equipment.

40. Students are never told that they are not capable of certain things. They are expected to perform. When necessary, realistic alternatives are presented.

41. Dry Cleaning - the use of student planned weekly "Specials", e.g. two skirts for the price of one. This enables students to polish their skills on selected kinds of garments.

42. Instructors avoid negative or emotional reactions.

43. Kindness is shown toward students. They are cared about. Emphasis is on the positive.

44. Instruction is personalized. Students' pictures or portraits (pencil sketches) are posted. Student dress is admired and commented favorably upon if it is in good taste.

45. Students are encouraged to get more education and training.

46. Tape recorders are used to improve oral language usage.

47. Students are shown a process, then allowed to try it themselves. If necessary, they are shown again. They are much more receptive the second time.

48. A manikin is used for student demonstration work in nurses aide classroom.

49. Nurses Aide students receive practical experience in a hospital or nursing home under the supervision of the instructor. They are encouraged to develop their own techniques in handling patient problems.

50. Overhead projectors are used for small group presentations.

51. In creative art demonstrations and/or experiments are carried out by a student or the instructor. This has the effect of motivating other students to try their hand at another art-form.

52. Tests, when used, show a student what he has learned. They are not used to determine grades. Grades are not given.

53. Marketing and Merchandising students learn about qualities of cashiers by going to stores and rating the cashier that waits on them.

54. An attempt is made to have each student learn something new each day.

55. Individual work station tool panels aid shop efficiency and have reduced loss of tools.

56. Student comments or criticisms are accepted with the idea of improving content, techniques, etc.

57. Emphasis is placed upon learning concepts through experiences rather than reading about them.

58. High quality work is encouraged and expected rather than just enough to "get by".

59. Entry and subsequent tests in Business Education are used to show the student what gains he has made.

MATERIALS

1. Short, instructor-produced, materials have been developed on a variety of topics.

2. Pamphlets and paperbacks are used extensively in several areas.

3. Selected materials in related subjects are directed toward the student's vocational interest area.

4. Several newspapers and a large selection of current magazines are used in Reading, Communications, Homemaking, and Social Communications.

5. An individual study sequence in psychology is used in Social Communications that helps promote self-understanding.

6. A series of questions, the answers to which can be found in current magazines, pamphlets, almanacs, atlases or filmstrips.

7. Students select and study materials with large print more often than those with small print.

8. Government Printing Office publications are used in nearly all areas.

9. Language lessons are used that employ local examples and student written sentences.

10. Trade and industrial publications are used in the technical and related areas.

11. No single textbooks are used. Reference materials are available that vary in difficulty and emphasis to accommodate student's ability and interest.

12. A series of retail sales language lessons were developed using Marketing and Merchandising materials.

13. Series of polaroid pictures are mounted and used to show the steps in various processes.

14. Programmed materials are used in several areas. They are supported by individual discussions and problem solving sessions.

15. A card game designed by the students and instructor is used to help students learn capitalization skills.

16. Programmed texts are used in a few areas to polish basic skills.

17. Sound filmstrips used in several areas with projectors that are designed for viewing by one to three persons. These are student operated.

18. Students in two areas are learning new words through the use of a modified tape recording machine utilizing cards with a strip of magnetic tape attached.

19. Films, filmstrips, and sets of slides produced by industry are available for loan or purchase - several areas use them.

20. Teacher produced manuals are used for training checker-cashiers and dry cleaning counter girls.

21. A few games are used in mathematics. The structure and strategy of games provide entry into a wide range of mathematical concepts.

22. Pre-recorded vocabulary tapes are used by students who need work on pronunciation.

23. Industry-produced charts and posters are used by several instructors.

24. Samples or portions of garments are made up showing steps and/or techniques of clothing construction. These are displayed on a series of flip charts.

25. Selected printing jobs are accepted from within the school district if they can be fitted into the training schedule.

26. Students browse and select books on art. They are encouraged to take these home for reading. If the book is a paperback they may keep it.

27. Glaze charts for the four kinds of clay used in art have been presented in four different ways -- mosaic, windchime, freeform mosaic, and relief. These charts, while primarily informative, have also had a motivating effect on students.

MOTIVATIONAL DEVICES

1. Art Shows - Several Art Shows have been set up at W.O.C. and at other places around the city. Work that is on display is also for sale. Most students find greater reward in the fact that people actually liked their work well enough to buy it -- money received seems to be secondary.

2. Coupons - Students receive a coupon worth ten cents for each class they attend. Coupons may be redeemed for lunches, dry cleaning, or automotive service. This system is very popular with the students. It generates several positive effects within our program in addition to providing immediate reinforcement of attendance.

3. Student Projects - Student owned engines, radios, etc. and private non-school equipment are worked on with much more enthusiasm than school training equipment.

4. Polaroid Camera - Pictures are taken of the student at the beginning of a sewing project, as it progresses, and at its completion. These pictures along with samples of the material and different details are mounted on an accordion-pleated story board. Students stop frequently to look at their progress and the progress of others. They also get great pleasure out of bringing in their friends to show them what they have accomplished.

5. Short Term Assignments - Short term assignments have been found to be one of the better motivational devices. A student is more likely to start and work on an assignment if he can see the end.

6. Checklist - A checklist of assignments, worksheets, projects, meetings, and activities is maintained in several areas. As each student in the class completes an activity, a checkmark is put in the proper square.

7. Successful Student Display - A large bulletin board upon which is displayed a close-up snapshot of each student who has gained clerical employment after having attended the Work Opportunity Center and has taken business training. A caption under the picture simply lists the student's name, place of employment, and type of work being performed. Some are depicted by two photos in a "before" and "after" arrangement. Prospective and beginning business students seem highly motivated by this display as they see the success being enjoyed by those pictured.

8. Time Clock - Most small engines students become hourly employees. A time clock was introduced as a training device. Use of this clock has motivated students toward better attendance. It has also simplified record keeping and provides a quick, line of sight reference showing who is in the shop. A time clock is also used in the marketing and merchandising classroom as it would be used in a place of business. Each student "punches" in or out for class as they would on a job. A student is assigned a rate per hour and calculates his earnings. Problems in determining deductions are also used. As a student progresses, his salary rate goes up.

9. Awards of Merit - An award of merit certificate is used in many areas of the Work Opportunity Center. The awards are earned by students for attending various series of classes and for completing certain tasks and assignments. For many students this may be the first such recognition they have received.

10. Insignia - Food Preparation is divided into five levels of accomplishment. Sleeve stripes are awarded to students for performance and attendance in various levels, and also inform the public of the student's position in the kitchen. Students attend and perform to be promoted from one level to another. Promotion is based on agreement of the instructor and the student department head and voted on by the entire kitchen staff.

11. Path to Charm - On "The Path To Charm" certificate, students plot their course with various colored stars as they complete units in personal improvement. Pictures taken with the Polaroid camera are inserted behind a felt paper frame on the certificate. These add recognition and a personal touch which the students need so desperately. Replacement pictures are taken and framed as the girls progress.

12. Books Expendable - This is a program which makes a variety of paperback books freely available to students. Several hundred volumes are on display, in bookstore-type wire racks, in the Reading Center. Students have complete freedom of choice in selection and are not required to seek permission before withdrawing a book. They are, however, encouraged to return the book when they have finished with it and to "swap" it for another. New titles are added each month to keep the collection up-to-date and to stimulate interest.

13. Written Contract System - Students enter into a written contract with counselors, teacher and others concerned. It "binds" both the student and the staff. He agrees to attend for a specific number of class hours, a specific number of days per week with the contract written for a relatively short period of time, depending on the resources of the student.

14. Point System - Because high school credit is important to many of our students, a point system is in effect in most areas of W.O.C. This system helps provide continuing reinforcement and facilitates record keeping and evaluation. One point is the equivalent of approximately one hour of work. Eighty points equals one credit. Fractional credit may also be recommended. This system complements the W.O.C. program.

15. Chart of Learning Units - A chart is on display in the business room depicting the various courses being offered. These courses are subdivided into fractional parts or learning units. The unique feature of the chart is in the visual subdividing. It is greatly simplified so that the student is not threatened by a feeling of insurmountable course work. Credit or check off is made early and quickly after the completion of the most rudimentary tasks. This is recorded on the business student's record card. As the student progresses through the learning units, credit and check off is given at specific junctures.

16. Field Trips - Art students have taken field trips to art museums, galleries, studios, exhibits, and theatres. Hikes and/or sketching trips have been taken to a dancing studio, the river, the downtown area, and the zoo. These trips are popular with the students and are always well attended.

17. Consultations - Individual and group consultations with students help eliminate grievances, improve attitudes, improve attendance, and make the students feel important. They also help instructors determine student needs, desires, etc. and make possible better referrals to other departments.

18. Re-Organization of Service Station - Peg board storage for tools - shelving for oil, etc. - rearranging of impulse sales items, painting back room and office, complete change of salesroom and office area. Helped establish a proprietory attitude in students - it's "our" or "my" station now.

19. Uniforms - An adequate supply of uniforms is maintained at all times at the Service Station and in the Cafeteria. This not only provides clean uniforms at all times, but has also been a definite, motivating factor in these areas.

20. Machine Parts - Students in the machine shop, on occasion, make parts for and rebuild machines that are no longer operable or are inaccurate to the point that they are of little value. This has been an excellent motivational device. A student can actually see the part that he produced functioning as a part of the machine.

21. Unstructured Time - Students are invited into the sewing room to work on an interior decorating oriented craft. A variety of simple projects have been completed. Each student keeps his project. A number of students who previously had little or no contact with each other have worked together in an atmosphere of friendliness and cooperation. These sessions are unscheduled, but generally take place once every four to six weeks.

APPENDIX C

CASE STUDIES

Case Study #1

This is the story of an 18 year old former dropout who made phenomenal personality growth within the brief span that WOC influenced him.

School adjustment difficulties started early with this boy. Home experiences such as illness, deaths, divorce and lonliness made deep impressions on him. He was afraid to make new friends, and afraid of new situations. A step-father entered the home and his immaturity began to improve somewhat during the elementary years. However, he continued to be slow and seemingly did not work up to his ability. In junior high he was described as lacking ambition and drive and one who did not apply himself. His achievement was mostly below average. This pattern continued in senior high school with increasing academic failures noted. He soon became another dropout statistic.

When he came to WOC we noted he was extremely wary of adults. He apparently felt alone, and not part of his home and family. He never had dates or much money. His real father, in whom he had a real interest, had remarried in another state. His attendance was very spasmodic initially but after a 3 week visit at his real dad's home, it began to build. That visit with his successful father apparently sparked some ambition for self improvement.

Here at WOC he came in for long talks. He seemed to seek out this counsel. One day he heard about a custodial job in a large factory. We pushed him into applying and he got the job - on his own and he is proud of that fact. His self-image improved, and so did his approach to life.

He began to emerge from his shell and wanted to be somebody. The school social worker helped him with the dating problem. Though he froze up at first suggestion of entering an MDTA welding program, informal work in ours convinced him that he could do it. He is now enrolled in a vocational school and there now appears to be some direction to his life.

Case Study #2

The young man who is the subject of this study, came to the Center at age 16½ after dropping out of the first semester of senior high school. He had done acceptably well in his studies under the circumstances, but he was a large person and felt he could progress better elsewhere.

His main problem was reading. It probably was the source of most of his feelings of inferiority and inadequacy in the school situation. Even among his brothers and sisters, he was the only one with this reading and comprehension problem. He had often been compared with his older brother who was now in law school, so our subject was often discouraged and frustrated in school work because of a poor foundation in basic skills.

In elementary grades these troubles showed up early. He was immature, had a short attention span, and often did not follow school rules. He was a child of many moods and did not adapt well to group work. He needed much individual attention and came to be classified as a slow learner. He tended to be awkward and fall clumsily into trouble. He was set back one year.

Part of his troubles perhaps stemmed from a slight hearing impairment. In a neurological examination at age 14 the doctor diagnosed some brain damage resulting in asphasia and almost complete absence of reading ability. Authorities were advised that it would be unreasonable to expect this boy

to learn by written symbols but must be taught by auditory stimulus. He had some success in the special reading program but for the most part had taken to acting out his frustrations. He often was the class clown. Some failures were evidenced in junior high and there were many absences in senior high. It is no wonder that he could not cope with the highly verbal character of our schools and finally dropped out.

His parents had heard of the Center and its excellent reading program. He entered WOC reading at about the 3rd grade level. His immaturity was exhibited during the first several months but under patient and kind treatment with an individualized program in a less competitive situation, slow progress began to be seen. In spite of a past record showing little promise for much progress in reading, in six months time his reading ability had risen to the 7th grade level.

He enrolled in many programs at WOC (Dry Cleaning, Service Station, and Small Engines), and completed most. WOC became a haven and he even turned down full time jobs so he could stay. Finally he became employed in a service station and we urged him to continue and to build a good work experience record. Some maturity has been shown and he has become less careless in his work habits.

Recently he was employed by a factory making snowmobiles. He has been doing test driving for them and other duties which seem well suited to his mechanical abilities. He seems very happy with this job and it seems also to be just the type of success he needs right now. It is doubtful that he will gain a diploma but there is no reason to believe that he cannot continue to be a successful worker.

Case Study #3

This 19 year old youth had a "tough-guy" self-image, consistently attired himself for that role, and fully acted out the part. He wore a "Hell's Angels" jacket, and boots to match. He packed a knife to class when he first entered WOC. During these first weeks he was not in top physical condition. He appeared bleary eyed as if affected by a hangover. He was content to just sit around hoping for recognition and attention from his peers. He had been in trouble with the law.

During his elementary years, the boy was described by his teachers as a real challenge, a dreamer, immature, having a short attention span and one who did not always follow the rules.

As a lad of 8 years, his mother died but the father kept the family of 4 children together. This event did not help his school progress. A pattern of much absence developed. By the end of elementary school he was retarded several grades in most basic academic skills.

There were many failures and absences throughout junior high school as well. Teachers generally rated him low on most behavioral trait scales. He failed the eighth grade in spite of apparently average abilities. He was not a behavior problem but he remained indifferent to learning situations. Much of his energies were apparently being used up in suppressing inner anxieties and underlying feelings of inadequacy and insecurity. In the classroom, the boy needed understanding and supportive teachers to build successes.

Poor adjustment continued in the two senior high schools he attended and failed to complete. He dropped out after earning a total of 13 credits. He had held several jobs but none permanently.

He came to WOC with a need for basic skills development. A parole officer pressured him into good attendance. He owned a motorcycle and was interested in cars so enrolled in Small Engines.

We advised him early to leave the knife out of the building and began to work on his attitudes. At first he was careless with tools, had poor work habits, and treated equipment with disrespect. This gradually began to change, however. His knowledge of engines grew and he took on responsibilities with the student advisory committee. He seldom before was a leader.

Several weeks later in the program, we noticed definite changes. He is clean, neat, and conscientious now, and plans for military service in the Air Force, and getting a diploma through GED tests. A number of staff members have contributed their influence to help this boy: his counselor, social worker, and teachers. Their consistent, patient efforts have been openly rewarded.

Case Study #4

This 17½ year old came to the Center as a dropout from both a suburban high school and a city high school. He had a record of increasingly poor attendance there and had several academic failures as well. Scholastic aptitude tests indicated average to above average potential, particularly in mechanical reasoning. In past personality evaluation, teachers rated him as cooperative when convenient, usually well balanced emotionally, completed most assignments, seldom was a leader, was accepted by classmates, and was usually reliable. He dropped out in the 10th grade.

He came from a family of seven children in which he was the second. His father had been in and out of the ministry and was a youth counselor

for the social welfare department of a large religious denomination.

When he came to the Center he had long hair and wore cutoff jeans most of the time. He was planning to enter the military and desired some pre-service technical training. Apparently there were difficulties at home and the service was one way to avoid those "hangups" at home. He liked cars, modern music (he played in a band) and most mechanical things. He had a fairly extensive record of employment as a busboy, stock boy, and fry cook.

He completed several shop courses at W.O.C. then enlisted in the Marines. During his time at W.O.C. his self-image and outlook on society changed somewhat but he was not enrolled for an extensive period. He seemed well satisfied with the mode of treatment and measure of independence he was afforded at W.O.C.